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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,006	08/01/2005	Dale Read	063030-00075	6806

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Pittsburgh, PA 15219

EXAMINER
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OLSEN, LIN B

ART UNIT	PAPER NUMBER
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3661

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/502,006	<b>Applicant(s)</b> READ, DALE	
	<b>Examiner</b> LIN B. OLSEN	<b>Art Unit</b> 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in the PCT on December 19, 2002. It is noted, however, that applicant has not filed a certified copy of the PCT/GB02/05810 application as required by 35 U.S.C. 119(b). Further, the specification has not been amended to claim priority.

### ***Specification***

The abstract is objected to as being too long.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

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- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### ***Claim Objections***

**Claim 4** is objected to because of the following informalities: As a dependent claim, the claim should start with "The" rather than "A". The second "a" in the first line should be removed. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claim 4** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

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described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claim is to a method used program a robot however, the claim does not define the steps of the process, therefore the claim encompass all ways to do the method.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 1 and 2** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that they fails to point out what is included or excluded by the claim language. These claims are omnibus type claims.

**Claim 3** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

At line 6 of the claim, the claim recites “processing said data” but it is unclear which data this refers to as lines 2-6 have listed many types of data organized into sets that could be included in said data.

The claim articulates many alternatives connected by “or”, this renders it unclear what combinations of alternatives are included in the invention.

At line 8, there is no antecedent basis for “manufacturing tasks”.

At line 10, it is unclear what is adjusted? – actual robot, manufacturing cell, virtual robot and/or virtual manufacturing cell?

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At line 13, there is no antecedent basis for "operative part"

**Claim 4** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 3, "parameters common to a plurality of different robots" is indefinite.

In line 3, the "or" between "for use" and "even using" is indefinite as these two alternatives define different genus of an invention.

In line 5, "the factory space has no antecedent basis.

In line 7, "said general program" has no antecedent basis, should it be "general virtual robot program"

**Claim 5** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 2, "Sensing means for" is not being interpreted as falling under 37USC 112 6<sup>th</sup> paragraph because so much detail is provided defining the sensing being done.

In line 3, is it unclear whether the position of one part or multiple parts of the robot are sensed.

In line 8, "design positions" does not have antecedent basis.

In line 9, "the tool" does not have antecedent basis.

Due to the number of 35 USC 112 second paragraph rejections, the examiner has provided only a number of examples of the claim deficiencies in the above

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rejections; however, the list of rejections may not be inclusive. Applicant should refer to these rejections as examples of deficiencies and should make all necessary corrections to eliminate the 35 USC 112 2<sup>nd</sup> paragraph problems and place the claims in proper format.

Due to the vagueness and lack of a clear definition of the terminology and phrases used in the specification and claims, the claims have been treated on their merits as best understood by the examiner.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claim 1** is rejected under 35 U.S.C. 101 as not being a statutory class of a process, product, manufacture or chemical. A "software application" is non-statutory per se because it is intangible and therefore cannot be "manufactured" in the traditional sense. There does not appear to be sufficient structural and functional interrelationships between the computer program and other claimed elements of a computer or processor which permit the computer program's functionality to be realized. For the claim to be statutory there is a requirement that there be a functional interrelationship among the data and the computing processes performed when utilizing the data. A process consisting solely of mathematical operation does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

Claim 2 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. A method claim must meet a specialized, limited meaning to qualify as a patent-eligible process claim. As clarified in *Bilski*, the test for a method claim is whether the claimed method is (1) tied to a particular machine or apparatus, or (2) transforms a particular article to a different state or thing. Claim 2 does not satisfy either of these criteria.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being obvious in light of Neubauer et al ("Learning Systems behavior for the Automatic Correction and Optimization of Off-line Robot Programs", Proceedings of the IEEE/RSJ international Conference on Intelligent Robots and Systems, July 7-10, 1992 pages 1355-1362). (Neubauer).



Regarding independent claims 3 and 5, Neubauer teaches: a method of programming a robot for operation in a robot manufacturing facility that uses a system as described in claim 5 comprising

establishing sets of design data including data relating to dimensions and relative positions of parts of a robot, positions of a robot base and of product handling and transporting equipment in a manufacturing cell and design data relating to dimensions and positions of parts of the proposed product,

establishing by processing said data, a robot program, comprising data and instructions for movement of defined parts of the robot for the manufacturing or assembly tasks to be carried out by the robot in that cell,

operating a virtual model of the robot in a virtual model of the manufacturing cell to check operability and (Introduction on page 1355 assumes that it is well known in the art that a program can be created to simulate the operation of a robot and that running it in simulation mode will bring it to a level of operability, but that the positioning accuracy will not be sufficient for operation of the robot)

after such adjustment as may be necessary to ensure operability at the virtual level, operating the corresponding real robot in the real corresponding real cell, with means for sensing the real positions of the operative part or parts of the real robot in relation to a real workpiece or product, supported by the real product handling or transporting equipment, (In the paragraph on page 1355 starting "Our approach..." Neubauer discusses running the program generated by the simulator tool and the robot with sensor(s) to measure the differences between the intended and actual trajectories)

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determining corrections required to bring said operative part or parts of the robot into the desired positions with respect to the real workpiece supported by the real product handling and transporting equipment in the cell, and

applying these corrections to the design data originally processed to establish a revised robot program for controlling the real robot in the real cell. (Further in the paragraph, the errors lead to a better robot model, and positioning errors are by compensated by adjusting parameters. The adjustment /measurement scenario is repeated until sufficient positioning accuracy is achieved.) With the guidance provided in Neubauer, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply these known techniques to improve similar off-line programming systems to yield the predictable result of more accurate positioning of off-line programmed robots.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer as applied to Claim 3 above in view of Nielsen et al, (Robot Off-line Programming and Simulation as a True CIME-Subsystem, Proceedings of the International Conference of Robotics and Automation, May 1992, pages 1089-1094).

Regarding claim 4, which is dependent on claim 3 in which, firstly, a a general virtual robot program is established using, for the design data relating to the robot, parameters common to a plurality of different robots suitable for use, or even using only coordinates describing positions and orientations of a robot tool in a reference frame

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fixed with respect to the factory space local to the cell concerned and a program suitable for a specific robot is determined by applying to said general program a program header specific to that robot and defining parameters in that general program in terms of known design parameters specific to the particular robot concerned.

(Nielsen develops a generic architecture for off-line programming – page 1090 section 3. It identifies the necessary components of a robot system. Models of robot systems are defined – Fig. 3-1. As described in section 4.1 on page 1091, robot independent movement instructions are used in the programming. In results, on page 1093, it was reported that different robot arm models were simulated and evaluated.) It would have been obvious to one skilled in the art at the time of the invention to apply the teachings of Neubauer relative to feedback to improve simulations to the work of Neilsen to provide the a way to generate the correct feedback signals for a simulations as desired in the paragraph above section 7 on page 1094.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 6,243,621 to Tao et al. for sensing the location of robot tools and workpieces and U.S. Patent No. 7,069,201 to Lindner et al for ways to simulate interactions of robot systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIN B. OLSEN whose telephone number is (571)272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin B Olsen/  
Examiner, Art Unit 3661

/Thomas G. Black/  
Supervisory Patent Examiner, Art Unit 3661